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## Inklings

Peter Daniel Miller

### *Etched in Memory*

Intaglio works of art – Etchings, engravings, photogravures – exist as both physical objects and as messages from other times and places. The materials are simply ink on paper or *washi*. But etching ink does not confine itself to the surface; it actually penetrates into the fibers of the paper. And therein lies a vital distinction, because that depth creates a three-dimensional world unique to intaglio. The soft pliability of etched or engraved copper, together with the pressure of the etching press, transfers lines and forms into the *interior* of paper. From those depths, the eye perceives the image as a living presence, though one that is quite different from those found in everyday life. Texture, form, light-and-shadow, composition, internal reflections, partial imprintings, layers, and an infinite variety of tone create a natural object that suggests the presence of something beyond itself and beyond everyday experience.

The content of that *something else* may be memories of distant times and places, emotional impressions formed 'in the heat of the moment', desire and longing, dread and repulsion, excitement, vividly remembered dreams. Whatever it may be, the intaglio image gives the viewer the uncanny sense of having *been there* before. The place may be a state of mind associated with a physical location, so that the feeling merges with where it originated. This sensation occurs so quickly that it bypasses conscious awareness. The viewer responds to the intaglio image itself and to the memories or visions it conjures up at the same time. If the etched copperplate holds the right amount of ink, transfers it to well-prepared paper or *washi* with a full array of tones, and evokes such a response, then the printing has succeeded.

### *Souvenirs*

The camera is often described as an instrument that 'captures' what is seen through the lens. Yet the unique quality of that moment, the observer's feeling, and *why* that image matters, elude capture. Miniaturization of image recording devices has only enhanced the proliferation of images that *don't* matter, because the emotional motivation, the *why*, is missing. Since we don't know the persons, places, events, or objects depicted, they mean nothing. Even images of apparently great significance when taken quickly fade, like old snapshots, photos of historical meetings, or stiff portraits. Isolated from the emotion that once animated them, they quickly become ghosts of themselves. This raises the question what is it about an image that stays in memory or evokes a memorable impression. Merely snapping the shutter in front of an assembled group, monument, battlefield, or whatever doesn't work. There must be something other than the subject matter that transports it over time, beyond the present moment, to make it memorable. That something turns out to be *composition*, the arrangement of forms, light,

shadow, texture, depth, tonal variety, and myriad other qualities that express graphic emotion.

As anyone who has returned to a formerly familiar place after a long absence can attest, *'you can't go home again'* because everything you knew now exists only in memory. And so the apparently permanent solidity of the physical world is revealed as an illusion, visible only by means of tones and hues, forms and lines, light and shadow, symmetry or dynamic balance, depth to symbolize near and far, and other graphic qualities. These are the same attributes that enable viewers to appreciate beauty. Etching and the other graphic arts work not by copying our visual surroundings, but by interpreting and re-casting them attractively to invite exploration and discovery.

Over time, printmaking techniques cycle between the rare and precious on one hand, and the widespread and readily available on the other. A novel technique is developed, skill is nurtured through long years of practice, and passed down through personal instruction. The technique in time becomes mannered, imitated, and accessible to unskilled copyists. Eventually publication-type prints compete in the market with rare original prints. While connoisseurs value individual style of execution and the tactile and graphic qualities of prints, popular demand responds more to information content and price. But tastes change. Yesterday's publication-type prints can become today's rare prints, as with Japanese woodcuts and some European lithographs and posters.

Landscape art in the past often made its living by professing fidelity to nature. It persisted in this fiction through a great variety of styles – Heavenly, Arcadian, Pastoral, Topographical, Sublime, in accordance with the desires of the day. These conventions were adopted by designers of parks and gardens, realizing on the ground what had previously existed only as abstractions. Thus Victorian English gardens, inspired by [French landscape painting](#), featured a variety of textures, a path for the eye to travel from foreground to middle distance to horizon, and a touch of classical allegory. Even while this peaceful vision reigned in gardens, landscape art found in the 'Sublime' an exciting mix of beauty and danger, favoring craggy peaks, steep waterfalls, isolated passes, and outright celebrations of the violent and uncontrollable forces of nature, in storms, tempests, and extreme environments.



Yet the illusion of documentary fidelity persists. Twentieth-century art banished representation while clinging to the illusion of capture, claiming to depict unseen or conceptual realities. Allegiance to the realist program nowadays owes much to the intellectual and artistic freedoms developed during the European Renaissance.

## *The Illusion of Realism in European Printmaking*



The Renaissance in Europe brought a new perspective – *Renaissance perspective*. Lenses and telescopes gave scientists and artists what they considered an objective view of the world. In 1525, Durer showed that a vertical section of a virtual pyramid could render the three-dimensional world accurately on a two-dimensional surface. The method was further refined in 1553, when the first written description of a 'camera oscura' appeared, explaining how light rays could be focused by a pinhole onto the opposite wall of a dark room, casting an accurate (though upside-down) image of the world outside. In 1568, a professor at the University of Padova found that a ground-glass lens gave a clearer, more brilliant image than the pinhole. Thus photo-like pictorial documentation was already built into European art several centuries before the actual invention of photography. The technical means of realizing

Renaissance perspective through photography awaited further developments in optics, light-sensitive materials, and etching.

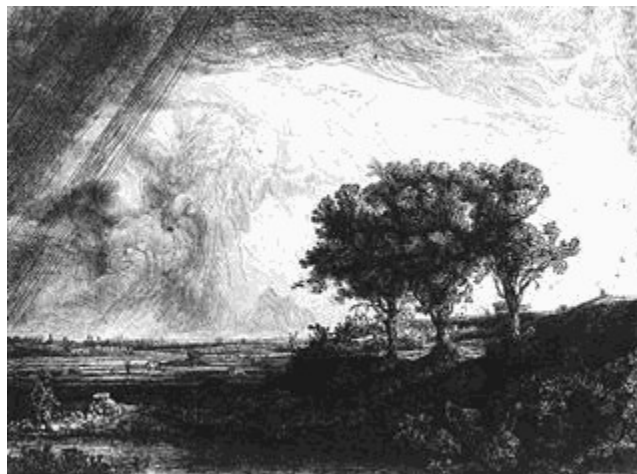
European artists throughout the pre-photographic era took advantage of the new optical devices to enliven the realism of their imagery. Using lenses, mirrors, pinhole-lit dark rooms (camera obscura), and later, portable image focusers (camera lucida), they painted portraits, interiors, and cities, often rearranging the latter to create more pleasing designs. Landscapes acquired a lifelike perspective and detail such as could have only been seen through a lens. The results were strikingly different from the stiff, posed look of previous art. Vermeer's '*Girl with a Pearl Earring*' stares at the viewer in a way never before seen. That bold glance is an utterly spontaneous, photographic moment. Canaletto too used a camera lucida for his etchings and paintings of Venice and London, though he often improved reality by rearranging these cityscapes as he liked.



Renaissance artists believed that everything, from the proportions of the human body to the Golden Mean in architecture, and perspective in landscape, could be expressed mathematically, uniting Truth and Beauty in one endeavor. Since then, the visual culture of the West has embraced the view of an all-seeing 'I' delineating an objective, geometric view of Nature. Geometric abstraction reappeared in the 20th century as Cubism, the grids of Piet Mondrian,

Bauhaus design, color field painting, computer graphics, and fractal art.

Further pursuit of realism led to new techniques of tonal differentiation and lighting contrasts to show volume and depth, most dramatically in the etchings of Rembrandt. Rembrandt took etching almost beyond its technical limits, massing dark tones to surround light that seemed to originate from within the print, creating graphic expressions of despair and hope. With the later invention of aquatint, a technique that aimed at producing prints resembling watercolors (hence the name), wash-like patterns of even tone could be printed. Having set out to imitate watercolor, aquatint created a new printmaking medium with its own expressive potential, one that later flowered in the art of Goya and Cassatt. The micro-grain aquatinting of copperplates also foreshadowed the pointillist technique in painting, in which tones and forms are delineated not by line but by arrangements of dots of different sizes and hues. That an image could be presented coherently through micro-dots of ink, as in aquatint, was crucial to the 19th-century invention of photography and the development of aquatint-grain photogravure.



### *The Invention of Photography*

At the dawn of the 19th century, the three elements of photogravure – optics, aquatint-grain etching, and light-sensitive materials – were all available. The European public fervently desired permanent realistic images of people and places. Yet many technical problems in these three then-separate specialties were formidable. During the 1820s and 1830s, W H Talbot in England and Nicéphore Niépce in France separately (and secretly) labored to focus sunlight through a lens, get the right exposure (often several hours on cloudy days), transfer the latent image to a plate, etch the plate in various tones, and make a permanent print from the etched plate.



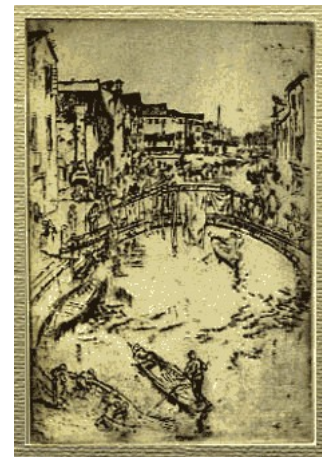
Talbot and Niépce each independently succeeded in combining their experiments in optics and light-sensitive materials with knowledge of etching and aquatint to create the first photogravure etchings during the 1830s. Talbot's *Haystack*, later published in *The Pencil of Nature*, displayed his notion of the new art as 'sun pictures' executed by Nature itself in etching ink on paper. That same



19<sup>th</sup>-century technique, with a halogen lamp instead of sunlight, is used for today's photogravure etchings.

Although painters had used optical devices for several centuries before the invention of photography, camera-made pictures exploded on the art world with reverberations that continue to this day. The invention of photography immediately inverted centuries of European graphic arts tradition, which taught that composition must proceed from broad designs and balance to the filling-in of detail. Suddenly, photography's seemingly magical fidelity to nature in all its chaotic detail acquired a greater cachet than the studied efforts of academicians to produce a pleasing harmony of color and form. This new graphic arts technique was denounced by academicians for elevating detail above composition. There ensued an elaborate *pas de deux* in which photographers imitated drawing and painting, while etchers and painters strove to get beyond realistic reproduction. In this way photography pushed the traditional graphic arts into the 20<sup>th</sup> century.

Impressionism was the first style to take advantage of this new freedom from the obligation to simulate reality. Venturing beyond literal reality, Whistler's 'Venice Series' re-drew the relation of the graphic arts to the natural world. Experiments by others followed: distorted and multiple perspectives, expressions of emotional states, Surreal fantasies, until by mid-20th-century, artists had renounced representation altogether. Abstract energy flows, color fields, form, gesture, and the action of art-making itself animated Western abstraction. Unlike Chinese abstraction of nearly a millennium earlier, the Western version responded to the competitive challenge of photography by seeking an alternate reality not accessible to the camera eye.



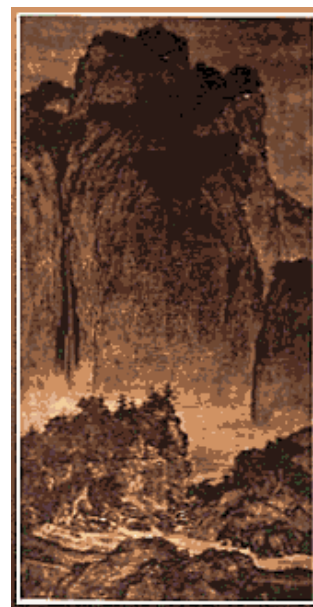
Nineteenth-century photographs were made with a variety of techniques, some like photogravure drawn from etching, others resembling watercolor or drawing. Having been ejected from the official Pantheon of Art, however, photography reverted to what the other graphic arts could not do – depict precise detail and 'capture' momentary events. Reportage and fashion came to define the new medium, especially after the invention of the 35-mm camera. This eyewitness persona of photography spread to the other graphic arts during the 1960s, as mass-media images became the dominant reference of collective experience. Celebrities were packaged as Art, packaging itself was re-packaged as Art, exalting the superficial and converging with its own origins in advertising. In Day-Glo colors, blurred graininess, blown-up dots, the visual language of eyewitness photography permeated the art world wherever a claim to verisimilitude was sought. Photography returned to the contemporary art world with a vengeance, annihilating the distinction between fine art and mass media, reducing both to a visual vocabulary of shock. Proliferation of this hackneyed imagery spawned a counter-trend of 'vintage' antiquarianism celebrating old, often barely discernible images merely for their age. The bipolar extremes of mass-media imagery and

antiquarianism continue to define the photography market, which remains trapped in the debates that accompanied its origin.

### *Chinese Abstraction*

Nearly a millennium before any Western artist used abstraction, Artists of Sung Dynasty China (10th - 13th centuries) discovered and practiced it. Before then, the painter's job was to memorialize Emperors and the events of their reigns, to produce souvenirs much as tourists do nowadays. The Sung Dynasty was a time of political turbulence, however, with loyalty to one regime repaid by disgrace with its successor. The thoughts of artists and philosophers turned elsewhere in search of something more lasting than political power. Representation gave way to appreciation of the forms of ink on paper or silk, the organization of space, the style of brush-strokes, and of nature itself.

Fan K'uan and his successors used the tonalities of ink to give apparently empty space a tangible presence, making it an object like a rock or tree. These objects do not occur 'in' space or time, they are what space and time happen to be doing right now and right here. The notion of 'capturing' this instant or this place was, the Sung artists realized, merely a delusion of the memorialists and their Imperial patrons. Their art evoked the ephemeral nature of space and time as these are experienced. Travelers wandering through towering unscalable mountains, fishermen in vast uncharted waters, scholars lost in thought, these favorite subjects of Chinese and Japanese art, are intentionally inconspicuous elements of the vast landscape. In it, a gnarled pine, a rock, the distant mist, even a grain of sand has a significance equal to that of these travelers. From this powerful vision a whole world is animated, with the self merging into its surroundings, the elements of nature inseparable from the tonalities of the artwork.



### *Materials Matter*

Image-forming materials are never neutral recorders. Ink on paper has a certain take on the world, pixels on a screen have a vastly different take. In the 16th century, the engraved line

was accepted as realistic; a hundred years later it was seen as mannered and artificial, and the more freely-flowing etched line took hold. Painting moved off the frescoed walls and onto more portable canvas just when oil paints provided the means to render chiaroscuro lighting effects convincingly. Watercolor, and then aquatint, became equally adept at portraying fleeting atmospheric and lighting effects. Each medium and style presents a different view and actually changes the way we see.

The visual conventions of the day edit out most of what's there, assembling the chaos of photons into what the mind accepts as realistic. This lets us get through the day without being detained by questions about what's real or not, but the conventions of the day eventually seem old-fashioned or deficient in some newly appreciated aspect of reality. At that point, it falls to art to replace these conventions with new materials and ways of using them.

#### Further Reading

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## In Transit

### *Observations on watching an evening commuter train*



This daily miracle of coming and going, this endless flow, this transmigration of souls from home to work and back again, their private quests merging into larger or smaller purposes of livelihood, continuity, service -- this evening gathering a communion of strangers bound together in a common enterprise, hurtling through space in a common direction, illuminated against the night sky as if hitching a ride on a

ray of light, this glow-worm clinging to a rail, pregnant with travelers who will soon emerge and -- another miracle! -- sort themselves into their own shelters, not one in 10,000 embracing the wrong wife or hugging the wrong children. Everyone on the train has their own story, and each story is different, their secret sorrows, missed chances, regrets, their private joys, all-too-brief moments of happiness, accomplishment (recognized by others, or not), giddy delights that nobody else understands, weird attachments and obsessions unexplainable even to themselves. At intervals of five or 10 minutes these wheeled crates of fools and sages -- each quirky individual being both fool and sage -- these mind-boggling multitudes of eccentricity, go trundling off into the night...

*Introduction to the exhibit at the Museum of Urban Electric Transport,  
Saint Petersburg, Russia, May 2017*

We are constantly in transit, everyone. This unceasing moving around is our natural condition, ending only when we have stopped searching. Being always in transit acknowledges the uncertainty of our existence, the lack of fixed parameters, the inevitability of change. The conquest of distance was one of the first elements of civilization, the extension of human society beyond local limits, according to historian Fernand Braudel. Nomadic people traversed vast distances on foot and by horse, in pursuit of both war and commerce. Trade gave rise to the Silk Road, that network of caravansaries linking Europe with Asia. The democratization of these inter-continental trade routes by rail made it possible for people of ordinary means to experience foreign lands routinely. The fractal replication of these routes in cities enabled local commerce to benefit from international links. Urban electric transport, which this Museum celebrates, is thus part of our common culture.

## **How to Look At Prints**

### *1. Henri Focillon, The Life of Forms (excerpts)<sup>1</sup>*

We must never think of forms, in their different states, as simply suspended in some remote, abstract zone, above the earth and above man. They mingle with life, whence they come; they translate into space certain movements of the mind. (p 60)

The life of forms gives definition to what may be termed 'psychological landscapes', without which the essential genius of the environments would be opaque and elusive for all those who share in them. Greece, for instance, exists as a geographical basis for certain ideas about man, but the landscape of Doric art, or rather Doric art as a landscape, created a Greece without which the real Greece is merely a great, luminous desert. Again, the landscape of Gothic art, or rather, Gothic art as a landscape, created a France and a French humanity that no one could foresee: outlines of the horizon, silhouettes of cities -- a poetry, in short, that arose from Gothic art, and not from geology or from Capetian institutions. But is not the essential attribute of any environment that of producing its own myths, of shaping the past according to its own needs? (p 61)

Even before it becomes formal rhythm and combination, the simplest ornamental theme, such as a curve or rinceau whose flexions betoken all manner of future symmetries, alternating movements, divisions and returns, has already given

<sup>1</sup> Henri Focillon, *The Life of Forms*, (New York: Zone Books, 1992), translated by Charles Beecher Hogan and George Kubler; originally published in 1934 as *La Vie des Formes* (Presses Universitaires de France). *La Vie des Formes* is available in French at no cost from Project Gutenberg, and from the University of Quebec at Chicoutimi, dans le cadre de la collection: '*Les classiques des sciences sociales*', dirigé et fondé par Jean-Marie Tremblay, professeur de sociologie.

accent to the void in which it occurs and has conferred on it a new and original existence. Even if reduced merely to a slender and sinuous line, it is already a frontier, a highway. Ornament shapes, straightens and stabilizes the bare and arid field on which it is inscribed. Not only does it exist in and of itself, but it also shapes its own environment -- to which it imparts a form. If we will follow the metamorphoses of this form, if we will study not merely its axes and its armature, but everything else that it may include within its own particular framework, we will then see before us an entire universe that is partitioned off into an infinite variety of blocks of space. (p 66)

In spite of its strict rules, the art of perspective was always, from the moment of its discovery, a field open to many possibilities.... Constructed perspectives remain fortunately bathed in the memory of imaginary perspectives.... To this background, which, although empty, is yet so laden with secrets as to be an essential to man's existence, Piero della Francesca brings new interest, and to it he gives shape. Not only does he establish the normal type of the constructed landscape, the *prospettiva*, by offering such reassuring guides to reason as the shape of building reasonably put together, but he also seeks to define the variable relationship between atmospheric values and his figures....

Beyond this it would not seem possible for us to go. The imaginary worlds of ornamental space, of scenic space and of cartographic space having rejoined the space of the real world, henceforth the life of forms must, it would seem, manifest itself according to unalterable rules. But nothing of the kind occurs. For, intoxicated by its own powers, perspective at once goes headlong to meet its objectives. By means of the *trompe-l'oeil*, perspective completely demolishes architecture and shatters its ceilings with one explosive apotheosis after another. It wipes out the boundaries of stage scenery by creating a false infinity and an illusory vastness. Perspective extends the limits of vision until the very horizon of the universe is exceeded. (p 92-93)

Technique may be interpreted in many various ways: as a vital force, as a theory of mechanics or as a mere convenience.... I never regarded technique as automatism, nor as the curiosities, the recipes of a 'cuisine'; but instead as a whole poetry of action and ... as the means for the achievement of metamorphoses. (p 102-3)

The observation of technical phenomena... affords an entrance into the very heart of the problem [of judging art], by presenting it to us in the same terms and from the same point of view as it is presented to the artist.... To exploit its every possibility, we must still strive, within our inmost selves, to throw off the vestiges of certain old errors. The most serious and deeply rooted of these derives from that scholastic antinomy between form and subject matter. (p 103)

Form..., even before it takes possession of matter and space, already exists within them. The realization of this fact by the artist is what distinguishes him from the common man and, even more so, from the intellectual. For, the common man ... is no specialist in the invention and fabrication of what seem to him to be mere utopias of space, mere fabulous playthings. And yet, he never loses a certain innocence, a certain wonderment, that might otherwise be tarnished by what is known as taste. The intellectual, on the other hand, in his approach to reality does

have a technique, and it is the technique of logic. For this reason, he subconsciously despises the artist's technique, because he finds it necessary to make every activity conform to the processes of rational discourse. (p 120)

Is the life of forms in the artist's mind characterized, then, by the abundance and the intensity of its images? One would be inclined to think so at first: to picture such a mind as completely filled with and illuminated by brilliant hallucinations, and to interpret a work of art as the practically passive copy of some inner 'work'. This may be true in certain cases. But in general, richness, power and freedom of image are by no means the exclusive characteristics of the artist.... We all dream.... Memory likewise places at the disposal of each of us a richly stocked storehouse. Even as waking dreams bring the works of visionaries to life, so too does the education of the memory foster in certain artists an inner form that is neither an image, properly considered, nor even pure recollection, but a form that allows these artists to free themselves from the tyranny of the model. But the recollection thus 'formed' possesses special properties; a kind of inverted memory composed of deliberately forgotten things has already been at work. Deliberately forgotten to what ends and by what means? We are entering another realm than that of pure memory and imagination. We at once become aware that the life of forms in the mind is not copied from the life of images and of recollections. (p 121)

... The life of forms in the mind propagates a prodigious animism that, taking natural objects as the point of departure, makes them matters of imagination and memory, of sensibility and intellect,... and these processes [by which forms are propagated] are touches, accents, tones and values. (p 124)

## *2. Thomas Hoving*

Thomas Hoving, former Director of the Metropolitan Museum of New York, used this procedure to vet prints and other objects proposed for acquisition by the Museum:

- Write quickly your initial split-second reaction. Scribble down a detailed, pedantic description.
- What is the object's physical condition? Wear, age, repair, corrosion, etc.
- Did it have a use? [how did function influence form, etc.]
- Style. Identifiable, datable, consistent? If inconsistent why: transitional or multi-influence, etc.
- Comparisons for subject matter [how did other artists interpret the same subject?]
- Iconography and symbolism.
- Documentation.
- Scientific testing of inks, paper (for prints), ceramic glazes, paints.
- Back to #1. What is your reaction now?

The essence of Hoving's procedure is a dialog between first impression and considered judgment. Anyone who wishes to develop an independent capacity to select artwork can do the same, comparing different ways of looking, and learning how one's response changes. If your first reaction is 'there's something wrong with this picture', the next step is to try to find out why. Perhaps the color is off, due to

fading, or too bright, disguising lack of content. The title might describe something that the composition fails to evoke. Or there's no 'there' there besides a famous name. On the other hand, sometimes a picture just 'grabs' you; it's so arresting that you just want to stare at it. That moment of rapture is also worth further investigation. Maybe it reminds you of some place you've been, or some pleasant experience or state of mind. Whatever it is, that connection becomes an occasion for repeated pleasure, which is what living with artwork is all about.

### 3. Stanley William Hayter<sup>2</sup>

Stanley William Hayter, the prolifically inventive engraver who founded Atelier 17 in Paris in the 1930s, advised emptying one's mind of all preconceptions when looking at prints. He likens this to the creative action itself, whereby the artist experiences 'some force [that] had intervened beyond his own effort.' Hayter disclaims anything mystical here, accounting for it as 'no more than the liberation of an unsuspected resource of the imagination in moments of exceptional lucidity.' Viewers can, Hayter says, re-create the creative experience itself, putting themselves 'in the state of mind in which an artist might begin a work'. Then he describes this state of mind from his own experience:

*'I attempt to empty my mind of nonsense and superficial matters: in fact to make it a 'perfect blank'. This... sets free what Mallarmé calls <em>les sources pures</em>. By this he meant the exclusion of obvious associations; the emphasis on things present of themselves rather than the symbols of things elsewhere. ...In this state it will not only be possible but reasonably easy to distinguish whether anything seems to happen to him or not, somewhat as the artist himself does; and if... &nbsp;nothing has happened, he should at this moment reject that particular work.... Having registered the sensation of something happening,...&nbsp;any consideration of execution, of all the separate factors contributing to the work, might broaden and deepen his appreciation; but always consequent upon the recognition of an event....*

*For the reaction that I have tried to describe in a vague fashion to occur, it is clear that the work itself must possess one quality, variously described as spontaneity, authority -- in fact the ability to convince.... Where the operations on the plate, block, or stone have been used to repeat or translate an image actually existing in another medium, as drawing, sculpture, or painting,... it is hardly possible that in the work we are seeing the idea itself coming into being: we are not in the presence of an original work. So I would suggest [that the viewer] ask himself next if such a work could have arisen without the exercise of the particular operations whose result he is studying....*

*'In all this discussion of qualities in a print the reader has been invited to address himself to the artefact alone. Concentration on those books and articles intended to sell a product seems to me unlikely to bring the collector any greater knowledge of the subject. This quality of conviction... is that to which*

<sup>2</sup> Stanley William Hayter, *About Prints*, London: Oxford University Press, 1962, pp 127 - 129.



Peter Daniel Miller, Exploring Kamakura (2004, updated 2024)

*the result bears witness: it is impossible to fake, and its effect on the observer demonstrates it.'*

## Exploring Kamakura (2004, updated 2024)

A rural country environment envelops the train as it curves around from Ofuna to Kita-Kamakura. The station is a rather informal affair with no wickets on one side. [Now that side has checkpoints equipped for *Suica* charge cards.] Alongside the track is a road too small for most cars, but ideal for cycling or walking, framed by a sandstone tunnel. [The tunnel has since been blocked off, out of excessive consideration for safety.] Right at the station is Engakuji, once a flourishing settlement of several thousand, and still an active center of zazen, archery, and other pursuits. The impressive wooden gate announces Engakuji as one of the 'Five Great Temples' of Kamakura. A path opposite the gate leads up about 140 steps to the largest bell in Kamakura (2.6 meters high), a National Treasure. Nearby is a splendid view of Tokeiji from above.



Kamakura was fortunate in having been founded at a time of Mongol dominance in China, a situation which forced many talented Zen Buddhist priests to seek employment elsewhere. The Kamakura Shogunate, then a primitive backwater, welcomed them, and in this way Zen was introduced into Japan. Not content with an empire extending from China to the eastern Danube, descendants of Ghengis Khan sacrificed tens of thousands of warriors in a series of futile attacks on Japan. As an act of homage to both the Japanese and Mongolian war dead, Engakuji was founded in 1282 by Tokumine Hojo. Its first spiritual leader was Sogen Mugaku, a distinguished Chinese Zen Buddhist priest. His successor Soseki Muso designed many of the temple gardens of Kamakura and Kyoto, and his abilities so transcended politics that he survived the change of regime that ended the Kamakura Shogunate in 1333.



Continuing on the trackside path (which was recently, and unnecessarily, paved), a street to the left leads to Meigetsuin / 明月院, 'Temple of the Bright Moon'. Though best known as the 'Hydrangea Temple', the name comes from a 14th-century official and is symbolized by a moon-shaped door framing the inner sanctuary. The hydrangeas (all 20,000 of them) are worth seeing in June if you don't mind crowds. (Other temples with hydrangeas are Jojuin, on the seacoast, and Mandala-do, in the hills between Zushi and Kamakura.) Meigetsuin also has a Zen garden and other flowering plants (narcissus, dogwood, forsythia) in season.



Where the trackside path joins the main road as it crosses the tracks, a trek up the hill takes you to Kenchoji, the first of the 'Five Great Temples' of Kamakura, and the oldest Zen temple in Japan. Kenchoji has a very impressive gilded gate, 700-year-old juniper trees, many treasures, and, perched on a hill above, statues of some mysterious creatures called 'Tengu' which combine crow-like and human features. Further up the hill, the path connects with the Ten'en hiking course which follows the ridgeline around to Zuisenji (about 40 minutes). The Ten'en summit gives a panoramic view of Kamakura towards the sea, with yamazakura in April and autumn colors in late November.

Another hiking course is a pleasant alternative to the crowded street route between Kita-Kamakura and Kamakura. From Jochiji, a quiet compound of temple buildings, also the place where Stanford historian George Sansom lived while writing his very engaging history of Japan, the path goes to the summit of Kuzuharagaoka Shrine, passes a seated statue of Yoritomo (angrily glaring at subordinates, it looks like), and one branch heads downward toward a pleasant residential area and Jufukuji. Another branch of the path from the summit heads down toward Zen-I-arai Benten, famous for its magical springs which, according to a legend invented by Prince Shotoku, doubles money washed in it. The clever prince sought to gain popular acceptance of paper currency, and it worked.



Across the street from Kenchoji is a curious place called En'noji which has a collection of '*Nio*' guardian dieties whose job is to banish evil thoughts and spirits. To accomplish this worthy task they present hideous grimaces and threatening postures. Pictures aren't allowed, so I don't have any from there.

Cresting the summit separating Kita-Kamakura from Kamakura, on the other side of the hill is Hachimangu, a shrine well and truly dedicated to the god of war. A different approach to Hachimangu, from the ocean, proceeds along a graceful walkway rimmed with cherry trees. Its width narrows imperceptibly from five to four horses, to foil invaders. [This path has since been straightened to a constant width, obliterating 800 years of history.] Yoritomo, the founder of Kamakura, gave no advantage to his many enemies. The huge ginkgo tree at the left of the shrine, whose leaves are bright golden



during the first week of December, hid the assassin of Sanetomo, the third Shogun, a harmless fellow who got in the way of ambitious relatives. [This tree fell in March 2010, another 800 years of history gone. Fortunately it was at 4:00 a.m.; at noon it would have taken out dozens of tourists.] The ponds on either side of Hachimangu are named Genji and Heike, two clans that engaged in bitter warfare across several generations. Twice a year, in April and September, devotees of *yabusame* practice horseback archery. Hachimangu's peaceful appearance now, with weddings on lucky days, *schichi-go-san* in November, and year-round festivals, gives no hint of its warlike past.



Walking through the Bamboo Temple of Hokokuji is an experience of quiet majesty, whether on a sunny day with cathedral-like light filtering through, or a rainy day of with mist in the air. At a teahouse set near a little waterfall in this bamboo grove, tea ceremony is performed. In this neighborhood are houses where Yasujiro Ozu filmed *Tokyo Monogatari*; Setsuko Hara herself lived here. Up



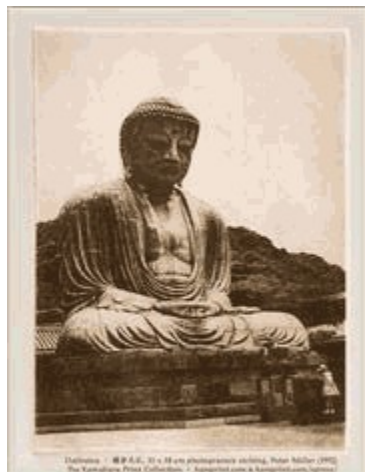
the road from Hokokuji, a path off to the left leads up Kinubari-san, the summit of which gives a panoramic view of the Kamakura seaside, including Enoshima and (if skies are clear) Fuji-san. Yoritomo, though a fierce warrior, had his soft side too. When his wife Masako remarked how lovely this mountain might look in the snow, he had the entire mountain draped with silk, hence the name Kinubari-san. They were a troubled family though, all of their descendants killed by relatives, Yoritomo's half-brother mercilessly hunted down and beheaded, Yoritomo himself killed in a fall from a horse in 1199. Masako ruled from behind the scenes during the succeeding Hojo regency. The Hojo regime ended in 1333 with a timely adjustment of loyalty to an Imperial restoration, which rewarded the new rulers of Kamakura with the designation of Ashikaga shoguns. Their memorial is here at Hokokuji, another peaceful tribute to a bloody past. Further down the main road, Godaido gives the impression of a country village with its pair of thatched-roof buildings. Further still is the Asahina hiking course, an ancient path used to transport the building materials for the Daibutsu. Past the Asahina summit with its stone-carved Buddha, the path leads to Kumano Jinja, a shrine set deep in the woods with tall cedar trees.



The plum blossoms at Jomyoji are among the best in Kamakura (though they are more numerous at Zuisenji and Kosokuji), and the view from behind the temple into a misty valley a glimpse of old Japan. Jomyoji also has a tea ceremony, and



also houses Ishigamo Garden Terrace on its upper grounds in an Italian-style mansion, a pleasant place to rest from the morning's exertions. Home-made stone-baked bread is one of the specialties. For Japanese cuisine, another choice in this area is Sakai, which specializes in somen.



In the Hase area of Kamakura, everyone knows the Great Buddha. Less well-known is the nearby temple of Kosokuji, set in a secluded valley and full of numerous flowering plants. The plum blossoms are especially delightful in February. The odd-shaped cupola comes, I am told, from a roof that was originally so steeply pitched that the tiles fell off, hence the re-design. A cave on the grounds served as the prison for some of Nichiren's disciples; whose sincerity so impressed their jailer that he released them in order to obtain religious instruction. Stop off at Kaikotei for soba and at Chikara-Mochi, in a classic old wooden shop building for various desserts.

Further along the Enoden -- a charming one-track railway with hand-me-down railcars -- is Gokurakuji (Paradise Temple), which, fittingly enough, has an air of unassuming tranquility. Next stop is Inamuragasaki: a park at the cape there has a fine view of Enoshima and (in clear weather) Fuji-san. The sandy beach of the Kamakura coastline is sharply interrupted here by apparently impassable cliffs. This gave Yoshitsune the element of surprise in advancing his troops around the cliffs during low tide.



(Yoshitsune's military genius both saved and enraged his half-brother, the shogun Yoritomo -- a family quarrel that is the stuff of numerous Noh and kabuki dramas.) Two or three stations later the Enoden leaves the coast and turns into a streetcar as it passes through the old fishing-port of Koshigoe. On the site of the pagoda at Ryukoji, the government of the day was set to execute the dissident priest Nichiren, when a bolt of lightning smashed the executioner's sword. This being a persuasive message of divine intent, the government left him alone and he lived to a ripe and thoroughly unrepentant old age.





## **My Empty-minded Way (2018)**

As our natural surroundings recede into the background of the proliferating electronic clutter of our times, natural forms take on the flavor of the exotic. Forests, rivers, mountains are now like a foreign country that we visit but no longer inhabit. These wild places are known, if at all, like nearly everything else -- virtually. Continents move, ocean currents swirl, clouds hover above all -- but always at a distance. Re-discovering foreign lands, seas, and skies renews the wonder and awe of creation.

Despite the distractions issuing from the artificial intelligensia, nature still inspires art, embodying our primordial survival instincts -- nurture, escaping danger, enjoying brief moments of bliss, excitement, calm, the whole range of animal and human emotion. The play of light and shadow observed through kaleidoscopic forest-filtered sunlight, glimmering waves, flowing grasses, and the infinite moods of the sky connect with the most vital sources of our being.

Natural surroundings and the art they inspire enliven our inner lives and sharpen our perceptions. Just as the moods of trees and mountains and oceans vary from moment to moment, so do our own moods. This present moment -- of calm or turmoil, joy or sadness, exhilaration or torpor -- always has some counterpart in nature. Images that light that spark of recognition are what art is all about. Hidden, obscure, widely separated in time and space, or right here in plain sight, the graphic arts transform that experience into something viscerally recognizable, through composition, form, tonal variations, depth, and texture.

Chance having a central role in artistic creation means that it is best done with a purpose-free mind. The less we know -- and we really know very little -- the more mysterious a phenomenon appears, the more expansive its possibilities. My empty-minded way of creating art, initiated by the light-and-shadow of what attracts me at the moment, visualized in the field as ink-on-paper, laboriously transferred to a copperplate where the vagaries of etching and printing further influence the image, is the 'method' I pursue. Only by freeing the mind from any purpose (documentary, commercial, educational, political) whatsoever is it possible to create something memorable.

Such visions exist outside of time and place -- '*sub specie aeternitas*' -- a phrase historically associated with scientific truth, but equally applicable to visionary truth that carries the undeniable conviction of the moment, such that it stops time, catching it in the very act of passage. Awareness of these moments comes from the flow of sense-experience when immersed in nature or in solitary pursuits free of distraction. Those momentary, fleeting, evanescent responses to our surroundings transcend our everyday existence, and if we allow them to, evolve into ecstatic realization of the grand scheme of things.

When our private experiences differ from what we are told is happening, the discord must be resolved in some way. The sciences of attention-grabbing resolve it by destroying private experience, inserting their virtual world of click-bait in its place. These distractions, welcomed by those who 'freely consent to be addled' (as

Saul Bellow put it), have indeed wiped out much of our innate capacity for observation and elementary reasoning, paving the way for mass surveillance and control.

As personal experience of nature atrophies, so does the ability to learn from sense-experience and act accordingly. Yet these abilities are indelible parts of human nature; though quiescent they never quite disappear.

Art helps us cultivate them, appreciate the flow of time as it happens, merge memory and futurity in this moment, and thus find something to enjoy even in difficult circumstances. The experience of nature, the spontaneous insight, and the all-in 'at-a-glance' quality of graphic art, all three of these evoke instantaneous recognition. How this happens is a mystery, and it cannot be forced or planned other than to cultivate awareness. Such confluences of nature, art, and thought occur in music, meditation, pattern recognition, intuition, scientific discovery and other spontaneous thoughtways.

These experiences are also, surprisingly, the source of conventional reality, for, as Chuang Tzu put it long ago, *'The Tao unveils itself along the way; things become what they are as we notice them.'* Imagine, if you will, all the things you see conjured into existence by your regard. With art, that power of creative observation is yours.

## Collecting and Displaying Prints

### *Framing Tips*

1. Choose a frame that blends the artwork with its surroundings.
2. Use only archival (neutral pH or buffered) materials in framing.
3. Make sure your frames can be easily opened to refresh the mats (passepartouts) – avoid staples, glaziers' points, adhesives, sealants, kraft paper, and other contaminants.
4. Use archival mounting strips or framing corners to attach a print to a matboard. Never use adhesives in contact with any surface of the print paper, front or back.
5. Secure the matted print snugly in the frame. Fill any spare internal space with archival foam board.
6. Place the framed print away from direct sunlight, fireplaces, or other heat sources; keep temperature differentials and humidity to a minimum.
7. Cut plexiglass and mats one or two millimeters smaller than the inside of the frame.
8. Position the window of the mat slightly above center, as otherwise it looks too low. I set the top margin to 54 percent of the mat height, the bottom margin to 46 percent of the mat height of horizontal-format prints.
9. Use cool tones such as ivory or eggshell for the mat board, and muted colors and simple mouldings for the frame.

Intaglio prints, including photogravure etchings, are among the most permanent works of art in existence. The pigment in black etching ink is finely ground carbon particles: it never fades. Etching paper is made from cotton fiber, *washi* from *kozo* or mulberry fiber, or *ganpi*, none of which contain the ligin from wood pulp that causes deterioration of ordinary paper. Prints can be conserved safely in archival storage boxes, separated by interleaving sheets. It's better for them to be stored this way than in frames when not on view, and it saves space. Archival (acid-free, neutral-pH or buffered) storage boxes are available from art-supply sources.

### *Original Prints and Limited Editions.*

Throughout the more than five centuries of printmaking, people have cherished original prints for their hand-made qualities of tactile immediacy, range of tone or color, depth, and uniqueness of imprint. Each printmaking medium has a distinctive look, a visual 'language' of its own – the flowing line of engraving, the incisive etched line, the watercolor-like shading of aquatint, the tonal subtlety and depth of photogravure, the autographic look of lithographs, the flattened planes or bold outlines of woodcuts, and many more.

Over time, printmaking techniques cycle between the rare and precious on one hand, and the widespread and readily available on the other. A novel technique is developed, skill is nurtured through long years of practice, and passed down through personal instruction. The technique in time becomes mannered, subject to

imitation, and accessible to copyists. Eventually publication-type prints compete in the market with rare original prints, displacing them. While connoisseurs value individual style of execution and the tactile and graphic qualities of prints, popular demand responds more to information content and price. Yesterday's publication-type prints can become today's rare prints, as with Japanese woodcuts and some European lithographs and posters.

Original photogravure etchings are made by hand, one impression at a time, from a copperplate etched by the artist. Each pass of the copperplate through the etching press wears down the plate, which is why limited editions have natural rarity. Differences within the edition result partly from plate wear, but more important than the minor distinctions between earlier and later numbers of the edition are the dramatic interpretive variations that can occur with different ways of removing ink from the copperplate. For those who prefer a mass-produced appearance, the rigid uniformity of posters and digital prints is adequate. Those who prefer the distinctive tactile quality of a hand-made print might choose among variations within the edition. Knowledge of printmaking techniques enables collectors to distinguish original artist-made prints from reproductions. Apart from the need to verify authenticity, appreciating the unique visual language of each medium enhances the pleasure of the viewer's visual environment.

## Technique of Photogravure Etching

### *Introduction and Update (2024)*

Since this guide was first published at the Kamakura Print Collection website, it has been one of the most popular, with tens of thousands of page-views. Many other technical guides have appeared and disappeared. The most valuable ones still available in 2024 are [Fanny Boucher's Atelier Héliog](#) and [Carles Mitja's site](#). Despite the very exacting technical requirements of photogravure etching, there are as many ways of producing them as there are photogravure practitioners. The knowhow embodied in actual practice resists every attempt at description, leaving it to every individual to learn as much as possible from these sources, then discover through experience what works and what doesn't work. At first, what doesn't work will occur far more often, until by a gradual process of elimination, the practitioner finds techniques suitable for particular workshop conditions prevailing, materials available, and expressive style desired. This guide is thus a set of personal preferences that has proved workable in my case. These preferences may and should be freely adapted to one's own workshop conditions, materials, and expressive style.

My own style favors the *intaglio* nature of photogravure etching. I like that it's part of a 500-year tradition, not to blindly venerate tradition, but because past etching practices reveal an extraordinary variety of creative possibilities. The physical, three-dimensional texture of intaglio links sight and touch, enabling viewers to place themselves in the image in a way that does not occur with flat coatings. So my technique uses the camera image only as a starting-point. I am not interested in a faithful reproduction of a photograph, nor of any other medium. The entire purpose of my technique is to create something new, which I might not even have foreseen through the camera lens. The etched copperplate gives me the chance to experiment with a wide variety of inks, papers, *washi*, wiping, and printing methods. The technique given below is thus very much biased toward creative interpretation of the photo-image so that it transcends the time and place of its origins.

Through five centuries of intaglio printmaking, artists have found copper to be the ideal material for imparting the most subtle nuances of tone and line to etching paper. It is soft enough to be engraved by hand, yet hard enough to hold the variable depth of ink that marks a real intaglio print. Copper when etched also does so in a consistent and gradual manner, provided the resist is firmly attached to the plate. Other metals such as zinc and steel have been tried, and more recently polymers, but these lack the differential depth of etching found in copper. For etchants, earlier artists used nitric acid, but since at least the 18<sup>th</sup> century, ferric chloride, also known as iron perchloride, has been found to work best. Actually a salt and not an acid, copper displaces the iron from solution, and does so gradually and visibly. In so doing, copper ions come out of the plate, creating the grooves that later hold ink when printed. What has worked well for centuries with line etching and aquatint, works equally well for photogravure etching.



Photogravure resist is a permeable gel, unlike the resist used in line etching. To make the photogravure gel light-sensitive, it must be mixed with a sensitizer. Since the first photogravures were made in the 1820s and 1830s, this sensitizer has been potassium dichromate or ammonium dichromate. A substantial body of knowledge and experience has accrued to this material. EU bureaucrats in their ignorance have banned it except in large corporations equipped to furnish large amounts of data proving its safety. It is certainly toxic, but rubber gloves and air vents are all that are needed for safe usage, and neutralization for safe disposal. Turpentine and other ink-cleaning materials in widespread use are more toxic, though nevertheless permitted. No other jurisdiction has followed the EU, and it may be hoped that the EU will at least permit small printmaking workshops in Europe to show they can use it safely. Meanwhile other sensitizers have become available, though they require much longer ultraviolet-light exposure times, which complicates consistency of results. Therefore the only resist sensitizer included in this guide is potassium dichromate.

Great improvements have been made in transparency materials and digital printers since this guide was first published. Early printer inks made from dyes did not block ultraviolet light well enough to register normal contrast. And they did not adhere very well to the transparency material. The transparency material itself was so thick that it diffused the UV light passing through it, degrading the clarity and resolution of the image. All of these defects have been remedied. Current transparency materials are ultra-thin, with just the right amount of stickiness on the ink-receiving side for a high-resolution image. Pigmented inks are now dense enough to block UV, enabling a full range of tones and good contrast. For a positive image to be UV-exposed to a sensitized resist, such transparencies are as good as photo film.

More people doing photogravure has also improved working methods, especially regarding greater independence of practitioners in relation to suppliers. Purchasing industrial-size quantities of 'carbon tissue' (unsensitized gel on semi-absorbent paper) in large rolls is now a thing of the past. Though useful for large-scale commercial printers, art-printmaking workshops could never use the entire 20-meter-long roll before the gel deteriorated; and cutting and flattening pieces from the one-meter-wide roll took much time and effort. Fortunately [brush-sensitizing on home-made resist tissue](#) is now a practical option, greatly reducing the time, effort, and cost of materials previously involved. Other steps in the tray-soaked resist sensitizing method in the directions below apply equally well to the brush-sensitizing method.

Photogravure practitioners seeking photo-reproductive fidelity generally opt for a single etching solution, while those seeking an intaglio look prefer multiple etching baths. (If space considerations seem to dictate a single-tray method, consider building at least three shelves to hold that many trays.) The multiple-bath method described in the following directions is designed for the artist-printmaker who seeks an intaglio look. It provides many opportunities to adjust contrast, darken or lighten various parts of the image, reveal shadows within shadows and a range of highlight tones, while the plate is etching. Experience with etching many previous copperplates is the best guide toward creating an intaglio impression. A well-

etched plate is easier – and more enjoyable – to print than one that is merely technically proficient.

### *Variety of Texture*

Photogravure etchings are a type of intaglio print, made by transferring ink from the recesses of an etched copperplate into specially prepared paper. Etchings, engravings, aquatints, drypoints, mezzotints, and photogravures all require an etching press, the pressure of which creates a platemark. This platemark, and the tonal nuance of the printed impressions, distinguishes intaglio works from woodblocks, lithographs, and silkscreens. Photogravure (also known as *héliogravure*, or *gravure à l'aquatinte*), uniquely among all the graphic arts, enables variable depth of etching, creating a great variety of tones and textures. These three-dimensional forms accentuate the light and shadow of the image, making it come alive in an unparalleled way.

The physical qualities of the print might evoke a particular mood. A rough surface might suggest a wild feeling, while a smooth or soft surface could evoke calm or tranquility. Flowing textures call to mind liquid forms, granular textures a sense of the particular (particle-like). Rhythmic textures made up of repeating elements, from the nearly invisible amoeba-like shapes of the aquatint grain or screen, to larger forms such as waves, might suggest a reassuring sense of order.

The photogravure etching technique I use is based on the inventions of W H Talbot and Nicéphore Niépce in the 1830s. The directions below, describing in detail how to make photogravure etchings, are based on my own experience; at each step there are many variations that will give equally fine results. Much depends on local atmospheric conditions, variations in materials and supplies, water quality, and other factors. The only rule is to do whatever works.

### *I. Prepare Positive Transparency*

1. From a well-exposed photographic negative, make a black-and-white transparency on graphic arts film, or print a digital negative with pigmented ink onto transparency material. The transparency should be less contrasty than the etching is expected to be. Unlike a conventional silver photo, the photogravure etching retains highlight and shadow detail, because the ultraviolet-sensitive resist responds in a completely linear manner to every increment of light. The transparency should be the size of the intended etching, as it will be exposed in contact and not by projection.
2. Mask the film transparency with red lithographers' tape to create a 'safe edge' about 15 or 20 mm wide around the image area. Press the tape down from the center outward so that there are no creases or air bubbles. Prepare the digital transparency with a black-bordered 'safe edge' about 15 or 20 mm wide around the image. The purpose of the 'safe edge' is to prevent ultraviolet exposure and consequent frilling of the resist during later development.

3. If a densitometer is available, develop the graphic-arts film or print the transparency material so that there is a density range of at least 1.5, for example a highlight density of 0.2 and a shadow density of 1.7. (Density is a numerical expression of opacity, on a scale of zero to three, of how much of the light is blocked.) This density range allows for full expression of all tones in the final print. While the transparency is less contrasty than the etching, the contrast will be recovered during the etching process.
4. Remove dust spots in film by applying spotting ink with a fine brush; in a digital transparency use the noise filter. Use selective sharpening in a digital image to avoid edge artifacts and grain, and to keep a natural look. For example, don't sharpen clouds or other features that do not benefit from a hard-edge look.

From this point on, the technique is the same for film or digital transparencies.

## *II. Sensitize Resist ('Carbon Tissue')*

1. From carbon tissue supplied in 20-meter rolls, place weights on unrolled end and cut to size, making sure the gelatin coating does not crack.
2. Using cotton or synthetic gloves when handling the carbon tissue, cut pieces that are 1 - 2 cm larger than the transparency and 1-2 cm smaller than the copperplate. (The gloves are needed to prevent fingerprints and oils from contaminating the resist.)
3. Store the cut sheets of carbon tissue flat between stiff boards, except those that will be used immediately. Secure with clips, wrap in foil or some other vapor barrier, and store it in the refrigerator if possible. Unsensitized carbon tissue can be stored this way for up to two years. Over time the tissue deteriorates and requires less and less UV exposure to produce the same light values, making calibration difficult.
4. Under a 10-watt amber safelight at least one meter or yard away from the work surface, mix the sensitizer with distilled or de-ionized water. Dehumidifiers are a good source of distilled water. If the mixing is done with warm water, wait for it to cool to about 20° C. before using, then pour it into a tray which is used only for this purpose.
5. With rubber gloves on place a cut sheet of the resist face up in the tray, noting the time. Hold the corners and edges down until it is fully immersed. At first it will have a tendency to curl, but after about a minute it will lie flat. Then pick up the carbon tissue and turn it face down, sliding it smoothly into the tray without any creases or bends. If the corners or edges protrude above the surface of the sensitizer, push them down into the resist solution, but not touching the bottom of the tray.
6. After 3.5 minutes have elapsed since first immersing the carbon tissue in the sensitizer solution, pick up the resist by one corner and let it drip onto a piece of clean plexiglass. Larger pieces of carbon tissue may need to be picked up at two corners, so that it does not curl back and stick to itself. A

longer immersion time gives higher sensitivity and lower contrast. Less immersion time increases contrast and lowers sensitivity.

7. Holding two diagonally opposite corners, first set the center of the sensitized resist face down on the plexiglass, then set the corners down so that no air is trapped between the surfaces.
8. Squeegee from the center outward with sufficient pressure to remove excess sensitizer and adhere the resist to the plexiglass, and to remove all remnants of trapped air, but not so hard as to weaken or distort the delicate gelatin. It is best to do this quickly, as the adhesion of the sensitized carbon tissue is firmest upon first contact.
9. Dry the sensitized resist evenly by directing the air current from a fan over (not onto) the back of the resist. An apparatus to rotate the plexiglass-adhered carbon tissue is useful to ensure even drying. After about two hours (more if humidity is high), gently peel the sensitized carbon tissue off the plexiglass, making sure the surface does not crack. Usually the periphery dries before the center, but avoid the temptation to peel it off before entirely dry, otherwise a circular area of thicker resist will remain in the center.

### *III. Expose the Resist*

1. Handle the sensitized resist only with cotton or synthetic gloves, and only under an amber safelight to avoid contaminating or fogging it.
2. Since each UV light source has a different intensity and spectrum, test UV exposure with step wedges (transparencies with a series of known densities) to indicate the proper exposure for a given UV light source. Always use a blackout curtain around any UV light source, and never look directly at a UV lamp when it is on. The test procedure is the same as the procedure for an actual transparency as described below. The exact time of ultraviolet exposure depends on the spectrum, intensity, and distance of each light source from the resist surface. It might vary from as little as 30 seconds to several minutes, depending on the equipment used.
3. Adjust UV exposure as needed for aging of the carbon tissue, density of the transparency, sensitizer concentration, the order in which the resist has been soaked in sensitizer, and whether a light-toned or dark-toned gravure print is desired. For example, a very dense transparency might require more UV exposure than normal. If the same tray of sensitizer solution is used for more than one piece of resist, the first one has more sensitivity than succeeding ones. My rough estimate is that the second piece of resist requires a UV exposure of 17 percent more than the first piece, all other things (such as the positive density) being equal.
4. If a screen is used as aquatint grain, expose the screen with 1.5X the image exposure, to ensure that the 'lands' of the plate will be more prominent than the brightest highlights of the image. A stochastic, or random-pattern screen

is best, as it gives the closest resemblance to aquatint grain. Screens of various degrees of coverage are available; usually 70 percent or 80 percent gives good results.

5. If an aquatint grain is used, let the largest grains in an aquatint box fall for about 30 seconds before placing the copperplate inside, assuring that only the finest grains fall on the plate. If additional coverage is needed, repeat the process -- remove the copperplate, pump or shake the aquatint box, wait 30 seconds, and replace the copperplate in the aquatint box, being careful not to disturb the first coating of aquatint grain while doing this.

6. Position the masked transparency over the sensitized resist in the vacuum frame, taking care that the entire image area is covered. (This is the reason for cutting the carbon tissue to a size slightly larger than that of the transparency.)

7. If an aquatint grain is used (see aquatint safety recommendations), expose the transparency only.

Ultraviolet light (UV) sets off a chemical reaction known as cross-linking or polymerization that hardens or crystallizes the gelatin. When exposed in contact with a transparency (Figure 1), the shadows block most of the ultraviolet (UV) light, leaving most of the gel soluble. Under the transparency's highlights which admit more UV, however, the gel hardens more. Metal-halide light sources give more consistent results and are safer to use than carbon-arc lamps.

The aquatint grain creates microscopic 'lands' on the copperplate which remain unetched. Particles of asphaltum are allowed to rain down on the copperplate and are then fused over high heat until they flow into an amoeba-like shape.

The unique look of photogravure depends on the variable depth of the etching, the ability of the copperplate to transfer far more ink to the shadows than to the highlights of the print, and to register subtle gradation of tone. What enables the plate to be etched to various depths is the linear sensitivity of dichromated gelatin to ultraviolet light. Unlike conventional silver-based photographic materials, dichromated gelatin is sensitive to every nuance of light intensity in equal measure. This enables it to register highlight and shadow detail not found in conventional photographs. The gelatin resist is partially permeable: It allows the etchant to seep through depending on how thick or thin the gel is. Where the gel is thin, etching is deep, and where thick the etching is shallow. The deeply etched parts of the plate hold more ink and form the dark parts of the gravure print, the lightly etched parts less ink, creating the highlights.

Molecules of gelatin activated by UV light bind to one another in long chains through a mechanism known as cross-linking. Cross-linking makes the resist more or less insoluble depending on how far it extends through the gelatin. The amount of cross-linking, remarkably, tracks the amount of UV precisely, even at the extremes of light and darkness. While ordinary photographic films and papers miss the near-whites and near-blacks because of their uneven sensitivity, UV-sensitive materials register the finest gradations of tone faithfully.

#### *IV. Adhere Exposed Resist to Copperplate*



1. Remove any scratches from copperplate by scraping and burnishing with plate oil.
2. Polish copperplate with metal polish.
3. De-grease copperplate with fresh sodium hydroxide solution, followed by a fresh acetic acid / salt solution, wiping each time with a clean rag. If the water beads up, repeat until the water flows smoothly off the surface of the copperplate. The slightest impurity can cause poor adhesion of the resist and ruin the etch.
4. Dry copperplate quickly by blotting with paper towel in front of fan, so that there is no tarnishing, and place it conveniently to hand.
5. Soak exposed resist in distilled water one minute -- don't over-soak.
6. Immerse the clean copperplate in 27° C. distilled water.
7. Quickly adhere one edge of the exposed resist to the copperplate, carefully aligning it just inside the edge of the plate, with no overhang. Pull both quickly out of the warm water, and position the copperplate on a stable surface. Squeegee or roll over the resist from the center outward until it is firmly adhered to the copperplate, making sure no air is trapped between the two surfaces. If there is a slight overhang due to misalignment, cut off the loose portion of the resist, assuming it is not large enough to include any part of the image.
8. Wipe excess liquid off the back of the adhered resist, and let it dry ('cure') for one or two hours.

#### *V. Develop the Resist*

1. Immerse the plate, with the exposed resist adhered to it, in warm (27° C.) water, on supports at the corners so that it is about 1 or 2 cms above the bottom of the tray. Gradually increase the temperature of water in the tray to 41° C., directing a flow of warm water well away from where the plate is positioned, until the backing sheet is loose enough to peel off without dislodging the resist.
2. After a few minutes, preferably no more than five minutes, peel off backing sheet slowly, with warm water flow turned off so that the delicate resist is not damaged. If the peeloff doesn't proceed smoothly, don't force it, otherwise the image will peel off.
3. Agitate plate gently in 41° C. water for about five minutes until all the unexposed resist is washed off. Swab very gently with clean wet cotton to remove unexposed resist faster. But swab in different directions so that no streaks or marks are left in the wet resist. When one piece of cotton becomes saturated with the removed resist, quickly use a fresh piece of clean wet cotton. The 15-mm 'safe edge' prevents the edge of the image area

of the patterned resist from washing away. The image becomes faintly visible in the hardened resist that remains on the plate after the unexposed resist has been washed off. The total warm-water immersion time must be minimized to prevent bubbles and blisters from forming in the resist. (These problems typically occur in over-exposed resist, so use only the minimum UV exposure required to give adequate shadow coverage.)

4. While the copperplate with the patterned resist is still immersed, cool the water gradually by adding cold water; then remove the copperplate and place it in a tray with alcohol / water solution for 30 seconds. The alcohol can be 50% to 80%, depending on the type of resist tissue used, and previous experience with the proper rate of drying.
5. Remove the plate from the alcohol / water solution, hold it at an angle, and immediately rotate it while drying the edges with a paper towel or rag. Do not allow water to flow back onto the image area, so that the image area dries evenly. Keep rotating the plate and drying the edges for 10 or 15 minutes. In large images, if evaporation is slow, water may tend to pool in the center or in areas of thick resist. If this appears to be happening, accelerate drying with a fan directed over but not onto the plate.
6. Set the plate in a vertical position, and rotate it 90 degrees every 15 minutes for one or two hours, to ensure even drying of the resist. Areas of thick resist, such as sky or other highlights, are particularly difficult to dry evenly, and these must be watched carefully for any signs of flow, pooling, or other unevenness.
7. With a 10X or 15X loupe, inspect the plate for flaws such as bubbles, blisters, under-exposure, over-exposure, resist breaks, mottling, wave patterns, poor adhesion, etc. It is generally easier to scrub off the patterned resist and start over than to repair the flaws that inevitably result from etching a damaged resist.
8. If the inspection shows a well-modulated range of tones so that both shadows and highlights can be etched while retaining full detail, and there are few or no flaws in the patterned resist, let it dry in a dust-free room for about 15 to 20 hours. The longer it dries, the harder the resist will be, a fact which can be used to increase or decrease etching time as needed.

The dried resist looks like a laterally reversed negative, light in the shadows (where the resist is thin) and dark in the highlights (where the resist is thick). It is actually a cast of the image that shapes the action of the etchant in the next step. To prepare the plate for etching, mask the image area and the back of the plate with packaging tape. This prevents etching of clear areas of the copperplate. Where the tape meets at the corners, smooth it down so that no etchant can get through. Add tape 'handles' to both short edges of the plate, so that the plate can be picked up for close inspection during the etching.

## *VI. Etch the Copperplate*

1. Using a loupe to see any breaks in the resist, apply stopout or etching ink with a fine brush to them. It is much easier to darken a small spot on the etched copperplate than to remove a pinhole.
2. While wearing rubber gloves, a workshop apron, and clothes that you don't mind staining, prepare a series of ferric chloride solutions ranging from 45-Baumé to 37-Baumé (a measure of concentration) at 20° C. (68° F.). Etchant concentration is measured with a thermometer-like scale, with the ferric chloride in tall glass cylinders of one-liter or two-liter capacity. Dilute the solutions, usually supplied as 45-Baumé, with distilled water (about 10 ml at a time), allowing time for the water and ferric chloride to mix thoroughly. Pour the etchant into four or five trays arranged from most to least concentrated. Use only enough etchant to permeate the resist, so that it's possible to see the progress of the etch without lifting the copperplate.
3. Place the positive transparency where it is visible, and identify the darkest areas, midtones, and highlights, in order to follow the progress of the etching. Watch for the etching to begin in the darkest areas, where the thinnest resist is located.
4. Immerse the copperplate in the most concentrated (highest Baumé) solution of ferric chloride and note the starting time. Allow at least one or two minutes for the high-Baumé solution to soak into the resist. Nothing appears to be happening, but the water in the high-Baumé solution is swelling the resist.
5. Move the plate to the next, more dilute solutions in sequence, watching for etching to begin. Etching begins when the ferric chloride seeps through the resist and touches copper, causing a flow of dark precipitate. Note the time when this shadow etching begins. Typically shadow etching begins five to 10 minutes after initial immersion. (If it takes too long, the resist has been over-exposed.) If deeply etched, dark shadows are suitable for the image, let these areas etch for a while before moving the plate onward. If less contrast, or a softer image is desired, move the plate sooner to a more dilute solution. In either case, aim for good shadow differentiation, avoiding the collapse to total black that is typical of conventional photographs.
6. If no new areas of the plate are being penetrated, move the plate to the next, more dilute solution to start midtone etching, and note the time when that begins. Identify the midtone areas from the transparency, and watch those areas in the copperplate. Let the midtones etch for about five to 10 minutes. The shadows will continue etching during this time.
7. Try to pace the etching so that the shadows etch for at least 10 minutes, preferably 15 minutes, while the brightest highlights etch for two minutes or less, with the total etching time between 20 and 30 minutes. This is where we recover the contrast that was intentionally limited in the positive transparency.

8. Let the highlights etch only briefly in the most dilute solution of ferric chloride. If the resist was over-exposed enough to slow highlight penetration, try breathing on the plate; the moisture in the breath helps the etchant to get through stubborn resists. All highlights except the most brilliant ones should etch lightly so that they have some tone and form. The formless, blown-out highlights of conventional photographs are to be avoided. At this final stage, etching progress may be obscured by the flow of precipitate. Highlights may appear unetched even though there could be very light etching, which only becomes visible after the resist has been washed off and the etched copperplate is inspected with a loupe. Generally one or two minutes in the most dilute etching solution is enough.
9. End the etch by immersing the plate in cold water and moving it around to remove all the etchant. Flood it with a flow of cold water to ensure that no etchant remains.
10. Scrub off the resist and aquatint grain (if any), and clean the plate with alternating baths of sodium hydroxide and a solution of acetic acid mixed with salt (80% water - 10% acetic - 10% salt by volume).
11. Inspect for etching flaws with a 10X or 15X loupe. Any irregularities in resist drying will show up as unwanted light areas replicating the shape of where water pooled or flowed. Resist breaks not covered with stopout etch as deep pits that leave dark spots in the print. Poor adhesion between resist and copperplate may result in horizontal seepage of etchant, causing asterisk-shaped 'devils' to appear. If the plate has been fortunate enough to escape these flaws, and has a full range of tones, it stands a good chance of producing a fine print.
12. If the etched copperplate has a full range of tones and there are no serious flaws in the proof, cut the plate to the size of the image, with or without a border as desired. File the edges to a 45-degree bevel, using a rough file to trim to a rectangular shape. With fine files and 600-grit sandpaper, or a burnishing tool and plate oil, file the bevels until they are smooth enough to not hold ink.

## *VII. Print the Edition*

1. One or two days before printing, prepare a stack of the etching paper, alternating wet with dry sheets, wrap them in plastic, and place a flat weight on top. Use distilled or buffered water. *Washi* is prepared by spray-misting rather than by immersion.
2. The etching paper or *washi* should be soft, but without any surface water or excessive dampness.
3. Polish etched copperplate, and, using rubber gloves, de-grease plate by wiping it vigorously with a rag soaked in sodium hydroxide solution, until water flows off the plate smoothly. If the water beads up or is repelled by

any spot on the plate, some grease remains. Keep at it until the copperplate is completely de-greased, so that the ink will transfer thoroughly to the etching paper.

4. Next, brighten the plate with an acetic acid / salt solution. This removes the surface layer of oxidation and thus also promotes full ink transfer. Dry plate quickly to avoid tarnishing.
5. Mix etching ink with cold-pressed linseed oil, kneading it repeatedly with a stiff ink knife until it has the desired tack or consistency. Ink that drops slowly off the ink knife, neither flowing nor fully adhering, has the ideal consistency. If etching ink is too thick, it will be difficult to wipe off; if too thin, it will come off too readily and yield a weak impression. Aim for an ink consistency that transfers the maximum amount of ink from copperplate to paper or *washi*.
6. Spread ink on clean copperplate, covering the whole plate evenly. Etching papers differ in how they take the ink, how absorbent they are. Their tone and surface texture also contribute to the overall impression. Contrary to what one might think, the inked copperplate actually prints quite well onto a rough-textured paper, giving a pleasing contrast between the image area and the texture of the margin.
7. Using circular motions and pressure of an ink-charged tarlatan, work etching ink thoroughly into all the crevices of the etched copperplate. Rotate the plate occasionally to change the angle of wiping.
8. Clear ink from the plate gradually with long sweeping strokes of the inky tarlatan from edge to center.
9. When an outline of the image is visible, change to a partially inked tarlatan and reduce the pressure of wiping. Concentrate on the shadows and midtones.
10. When the shadows and midtones become more defined, adjust the direction of wiping so that it goes from highlights to darker tones. (Otherwise, ink will be dragged from the more deeply etched areas, the shadows, onto the highlights.)
11. Using a clean tarlatan with very light pressure, continue clearing ink from the highlights, changing frequently to a clean area of the tarlatan.
12. Examine the plate in raking reflected light, and if plate oil or wiping marks are visible on the surface, remove them with very light short strokes of a clean tarlatan, and if necessary with a fine rag or the side of the hand lightly dusted with whiting (magnesium carbonate).
13. Clear ink from beveled edge, border (if any), and back of plate.

14. Position the etching paper on the inked copperplate so that the image falls in the center and is aligned with the edges of the paper. Two 90-degree rulers are useful for measuring plate size and paper size, and halving the difference to define the margins.
15. Adjust the pressure of the etching press so that it makes an even impression, with one thin felt and one thick felt on top of the copperplate and etching paper. Rotate the press without stopping during the transit of the plate through the press.
16. Draw back the felts and gently peel the etching paper off the plate ~ voilà! ~ the first impression.

### *VIII. Chine Collé Printing*

1. Ink and wipe the plate as described above in § VII. But wipe the plate more thoroughly, because in this type of printing the papers absorb more ink.
2. Cut a piece of ganpi to the exact size of the etched copperplate to be used for printing.
3. Immerse the inked plate in a tray of water (the ink and water won't mix).
4. Position the ganpi front side down on the inked copperplate and remove plate carefully from water while keeping the ganpi positioned correctly.
5. Let the ganpi dry partially, then brush on wheat paste from the center outward to the edges.
6. Again let the ganpi dry partially, using a fan if necessary.
7. Place plate and ganpi on press bed, set margins as before, and place heavier sheet of etching paper over the ganpi.
8. Print as above in § VII. The ganpi is adhered to the heavier etching paper and printed at the same time.
9. Peel the print off very carefully, so that the ganpi stays adhered to the heavier etching paper.